



## METHOD FOR LEVELING A STRING GROOVE OF A HOLLOW METAL RACKET

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### BACKFFROUND OF THE INVENTION

#### 1. Field of the Invention

This invention relates to a metal racket, particularly to a method for leveling a partial string groove not used for receiving a string of a hollow metal racket, in order to make the racket stronger and neater.

#### 10 2. Description of the Prior Art

Most rackets are provided with a string groove to hide a string to be netted on a racket so as to keep the string from directly contacting the ground and being damaged in hitting a ball. And there are generally two kinds of methods to form a string groove in a racket as described below.

15 (1) In forging a racket, a mold for a racket is provided with a string groove, so the racket produced has a string groove around its whole body.

20 (2) A mold for forging a racket is not provided with a string groove, but a hollow metal material for a racket is formed with a string groove by pressing the portion where a string is to be netted to form a string groove and the other portion is not provided with a string groove to keep the

racket strong and neat.

The first conventional method for forming a string groove in a hollow metal racket has an advantage that the it can have the strength it should as designed, and an 5 disadvantage that the portion of the string groove not needed is impossible to be removed, making its whole shape look not so neat.

The second conventional method for forming a string groove in a hollow metal racket, though it is 10 commonly used, has a large drawback that the pressed portion of the racket is weakened in its strength against pressure, in spite of the pressed portion being a netted portion necessary to have high strength.

#### SUMMARY OF THE INVENTION

15 This invention offers a method for leveling a string groove in a hollow metal racket, in which at first a straight metal tube with a string groove formed in its whole length is in advance prepared. Then the metal tube is placed in an outer mold specially designed, and then 20 two inner molds are pushed in the two free ends of the metal tube for a certain distance and then is retracted out of the metal tube so as to level the two end portions of the metal tube not to be netted with a string. In this way, the finished racket has a string groove only for the 25 portion to be netted with a string, but the other portion not to be netted is leveled as high as its original shape, improving the drawback of the two conventional methods

described above.

#### BRIEF DESCRIPTION OF DRAWINGS

This invention will be better understood by referring to the accompanying drawings, wherein:

5       Figure 1 is a block chart of a method for leveling a string groove in a hollow metal racket in the present invention;

Figure 2 is a perspective view of a hollow metal tube in the present invention;

10      Figure 3 is an exploded perspective view of an outer mold and two inner molds in the present invention;

Figure 4 is a perspective view of a hollow metal tube inserted in the outer mold in the present invention;

15      Figure 5 is a side cross-sectional view of the hollow metal tube inserted in the outer mold in the present invention;

Figure 6 is an upper view of the two inner molds being inserted in two ends of the hollow metal tube in the outer mold in the present invention;

20      Figure 7 is an upper view of the hollow metal tube with the two end sections leveled in the present invention; and,

25      Figure 8 is a partial perspective view of the hollow metal tube with the string groove wound into a racket in the present invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A preferred embodiment of a method for leveling a string groove of a hollow metal racket in the present invention, as shown in Fig. 1, includes five steps, a first one of preparing a hollow metal tube 10, a second one of 5 preparing an outer mold 20, a third one of preparing two inner molds 30, 40, a fourth one of placing a hollow metal tube 10 into the outer mold 20 and properly positioning of the outer mold 20 and the inner molds 30, 40, and a fifth one of pushing the inner molds 30, 40 in 10 the hollow metal tube and then retracting them out to finish the leveling the string groove of the hollow metal tube.

The first step is to prepare a hollow metal tube 10 with a string groove 11 formed in the whole body of the 15 tube 10 by means of a mold, becoming a material for a racket.

The second step is to prepare the outer mold 20, which consists of an upper mold 21 and a lower mold 22 respectively provided with an upper straight groove 211 and a lower straight groove 221 as shown in Fig. 3. Both the upper and the lower straight groove 211 and 221 are 20 as long as the hollow metal tube 10, and form an inner hole of the same cross-sectional shape as the cross-sectional shape of the hollow metal tube 10 after 25 the upper mold 21 and the lower mold 22 are combined together.

The third step is to prepare the inner molds 30, 40

which have a preset length, having the same cross-sectional shape as that of the inner hole 12 of the hollow metal tube 10 with the string groove 11 and a front cone-shaped end 31, 41 respectively for easily 5 guiding the inner molds 30, 40 to be inserted in the inner hole 12 through two open ends.

The fourth step is to placing a hollow metal tube 10 in the upper and the lower straight groove 211 and 221 of the upper mold 21 and lower mold 22 of the outer mold 10, as shown in Fig. 5, and the outer mold 20 with the hollow metal tube 10 is then positioned stably on a table 50, with the two inner molds 30, 40 respectively placed to align to two free ends 13 of the inner hole 12.

The fifth step is to push and squeeze the two inner 15 molds 30, 40 in the inner hole 12 through the two free ends 13 of the hollow metal tube 10 to level up the two free end sections of the hollow metal tube 10 where the string is not netted. And then the two inner molds 30, 40 are retracted out of the inner hole 12 of the hollow metal 20 tube 10, finishing the method for leveling a string groove of a hollow metal racket in the present invention.

As shown in Figs. 6 and 7, the two inner molds 30, 40 are pushed by a force F of a machine into the two free ends 13 of the inner hole 12 of the tube 10, for a present 25 length to level up those sections where the string is not netted, leaving the string groove 11 in the netted portion. Then the two inner molds 30, 40 are retracted out of the

inner hole 12 of the tube 10 and then the finished straight hollow metal tube 10 may go through other subsequent processes to become a finished racket.

The method according to the invention involves the 5 advantages of the two conventional methods described above, with the directly formed string groove 11 and with the netted portion of a hollow metal tube not pressed to change its original shape, so the racket has better strength against pressure, with the netted portion 10 only having the string groove 11 and with the rest portion neat and good-looking

While the preferred embodiment of the invention has been described above, it will be recognized and understood that various modifications may be made 15 therein and the appended claims are intended to cover all such modifications that may fall within the spirit and scope of the invention.